

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Takafumi Hashimoto et al.

Serial No.: 10/070,782

Filing Date: March 12, 2002

For: PLUSH-LEATHER-LIKE SHEET
PRODUCT AND METHOD FOR
PRODUCTION THEREOF

Examiner: Preeti Kumar

Group Art Unit: 1751

DECLARATION OF MR. TAKAFUMI HASHIMOTO

Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Takafumi HASHIMOTO, residing at 162-7, Karihara, Ritto-shi Shiga, JAPAN, declare under penalty of perjury under the laws of the United States of America as follows:

1. I am a chemical engineer having earned a Master's Degree in industrial chemistry from the Kyoto University in March 1989. I entered employment with Toray Industries, Inc. (Toray), the assignee of this application, in 1989. From 1989 to 1992, I worked on dyeing and finishing of textiles, and from 1993, I have been engaged in mainly in research and development on manufacturing suede-like sheet comprising ultrafine fibers at the Fiber Research Laboratories of Toray. I am very familiar with the art relating to suede-like sheet comprising ultrafine fibers as evidenced by my experience.

2. In the Official Action dated February 2, 2004, claims 1-3 and 6-13 under 35 U.S.C. 103(a) were again rejected as being unpatentable over Nakashima et al. (US 5,376,466) for the reasons recited in the office action dated July 2, 2003. Claims 1-4, 6 and 8 were also again rejected under 35 U.S.C. 103(a) as being unpatentable over Akasawa (US 5, 679,418) for the reasons recited in the office action dated July 2, 2003. The office action dated July 2, 2003 stated that:

"Akasawa teaches a polyurethane composition suitable for producing leather-like sheets having a soft hand and excellent in durability and being dyeable with acid dyes comprising a mixture of: a first polyurethane (a) obtained by reacting: an intermediate product diol (D) with both ends thereof substantially being OH and obtained by reacting a tertiary amino group-containing diol (A), a polymer diol (B) having a number average molecular weight of 500 to 3,000 selected from the group consisting of polyesters, polycarbonates, polylactones and polyethers and an organic diisocyanate (CI), ... and a second polyurethane (b) ...".

3. We agreed that Akasawa is the closest prior art of which we are aware. Akasawa shows many examples and comparative examples in which the polyurethane consists of the first polyurethane (a) and the second polyurethane (b) and the first polyurethane (a) comprises polymer diols which contains polycarbonate diols of 40 wt% or less and the second polyurethane also comprises polymer diol having structural units from dimethyl siloxane. The amounts of the polycarbonate diols of Akasawa are explained in the Applicants' response dated October 31, 2003.

4. The Applicants thanks for the courtesy of the Examiner for granting an interview on April 20, 2004. During the interview, the Examiner indicated that he would consider a Declaration from the inventors indicating that the addition of 10 wt% more polycarbonate diol to

the sheets of Akasawa would not have been obvious. Solicited Claim 1 requires that the polyurethane comprises polymer diols which contains 50 wt% to 90 wt% polycarbonate diols, whereas Akasawa discloses polyurethanes for suede-like sheets that comprise polymer diols which contain less than 40 wt% polycarbonate diols.

5. The low wt% of polycarbonate diol taught by Akasawa agrees with the statement on page 2, lines 8-12 of the Applicants' specification that:

"...polyurethane employing a polycarbonate diol (hereinafter referred to as a polycarbonate-based polyurethane) has comparatively good light resistance and hydrolysis resistance but it is physically hard and there are difficulties in obtaining products with a soft handle".

This is why polycarbonate-based polyurethane has conventionally been employed in grain surface artificial leather and why Akasawa does not teach or suggest to those of ordinary skill in the art adding another 10 wt% beyond the upper limit of 40 wt% by employing 50 wt% to 90 wt% of polycarbonate diols to a suede-like sheet. One of ordinary skill in the art would believe, based on those teachings, that such an addition might well be quite detrimental.

6. I further believe that the following is also why the polycarbonate-based polyurethane had not been employed to suede-like sheet. Page 26, lines 7 to 13 and the paragraph bridging pages 26 to 27 of the Applicants' specification states that:

"...in the present invention the buffing treatment is conducted after application of a silicone lubricant along with the antistatic agent. By the combination of such silicone lubricant and antistatic agent, it is possible to obtain a leather-like sheet of elegant appearance, having a long surface nap, a suitable degree of lustre and little dyeing unevenness at the time of dyeing".

and

"The amount of silicone lubricant applied is preferably 0.03 to 1 wt%, and more preferably 0.05 to 0.3 wt%, in terms of the sheet weight before the buffing treatment.

If the applied amount of silicone lubricant is less than 0.03 wt%, there is formed a material of short nap and inferior surface quality, so this is undesirable. Furthermore, if the amount applied is over 1 wt% then, since the coefficient of friction of the sheet surface becomes too low, the processability is adversely affected in that, for example, at the time of buffing the sheet readily tends to meander and silicone lubricant is transferred to the buffing machine."

In other words, without the benefit of the above methodology, good surface quality and good fatigue resistance had not been obtained as they are in this invention.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed at Via Filippo Marchetti, 19, Roma, Italy, this 21st day May 2004.


Takafumi HASHIMOTO